

WHAT IS CLAIMED IS:

1. A system for planarizing or polishing a composite substrate comprising (i) a polishing composition comprising (a) about 0.5 wt.% or more of fluoride ions, (b) about 1 wt.% or more of an amine, (c) about 0.1 wt.% or more of a base, and (d) water, and (ii) an abrasive.
2. The system of claim 1, wherein the system has a pH of about 7-14.
3. The system of claim 1, wherein the abrasive is selected from the group consisting of alumina, silica, titania, ceria, zirconia, germania, magnesia, coformed products thereof, and mixtures thereof.
4. The system of claim 3, wherein the abrasive is silica.
5. The system of claim 1, wherein the abrasive is present in the polishing composition in a concentration of about 0.1 wt.% or more.
6. The system of claim 1, wherein the abrasive is fixed in or on a polishing pad.
7. The system of claim 1, wherein the fluoride ions are from a source of fluoride ions selected from the group consisting of fluoride salts, fluoride acids, fluoride metal complexes, and combinations thereof.
8. The system of claim 1, wherein the amine is an amino alcohol.
9. The system of claim 8, wherein the amine is 2-dimethylamino-2-methyl-1-propanol.
10. The system of claim 1, wherein the base is selected from the group consisting of inorganic hydroxide bases and carbonate bases.
11. The system of claim 10, wherein the base is selected from the group consisting of potassium hydroxide, sodium hydroxide, ammonium hydroxide, cesium hydroxide, sodium carbonate, and mixtures thereof.

12. The system of claim 1, wherein the system further comprises a quaternary ammonium compound.

13. The system of claim 1, wherein the system has a polishing
5 selectivity of oxide:nitride of about 2:1 or more.

14. The system of claim 1, wherein the system comprises a cationic species that reduces nitride removal from the composite substrate.

15. The system of claim 1, wherein the fluoride ions comprise less than
10 about 100% active fluoride ions.

16. The system of claim 1, wherein the system has a free alkalinity
value of about 0.001-0.15 mol/l.

17. The system of claim 1, wherein the system has a total alkalinity
15 value of about 0.005-0.2 mol/l.

18. A polishing composition comprising (a) about 0.5 wt.% or more of
20 fluoride ions, (b) about 1 wt.% or more of an amine, (c) about 0.1 wt.% or more of a base, and (d) water.

19. The composition of claim 18, wherein said composition further
comprises an abrasive.
25

20. A method of planarizing or polishing a composite substrate
comprising contacting the substrate with a polishing system comprising (i) a
polishing composition comprising (a) about 0.5 wt.% or more of fluoride ions, (b)
about 1 wt.% or more of an amine, (c) about 0.1 wt.% or more of a base, and (d)
30 water, and (ii) an abrasive.

21. The method of claim 20, wherein the substrate is a composite
semiconductor substrate.

22. The method of claim 20, wherein the substrate is planarized or
35 polished after having undergone a shallow trench isolation process.

23. The method of claim 20, wherein the substrate comprises oxides.
24. The method of claim 20, wherein the substrate comprises nitrides.
- 5 25. The method of claim 20, wherein the system has a pH of about 7-14.
26. The method of claim 20, wherein the abrasive is selected from the group consisting of alumina, silica, titania, ceria, zirconia, germania, magnesia, coformed products thereof, and mixtures thereof.
- 10 27. The method of claim 26, wherein the abrasive is silica.
28. The method of claim 20, wherein the abrasive is present in the polishing composition in a concentration of about 0.1 wt.% or more.
- 15 29. The method of claim 20, wherein the abrasive is fixed in or on a polishing pad.
30. The method of claim 20, wherein the fluoride ions are from a source of fluoride ions selected from the group consisting of fluoride salts, fluoride acids, fluoride metal complexes, and combinations thereof.
- 20 31. The method of claim 20, wherein the amine is an amino alcohol.
- 25 32. The method of claim 31, wherein the amine is 2-dimethylamino-2-methyl-1-propanol.
33. The method of claim 20, wherein the base is selected from the group consisting of inorganic hydroxide bases and carbonate bases.
- 30 34. The method of claim 33, wherein the base is selected from the group consisting of potassium hydroxide, sodium hydroxide, ammonium hydroxide, cesium hydroxide, sodium carbonate, and mixtures thereof.
- 35 35. The method of claim 20, wherein the system further comprises a quaternary ammonium compound.

36. The method of claim 20, wherein the planarization or polishing of the composite substrate takes place with a polishing selectivity of oxide:nitride of about 2:1 or more.

5 37. The method of claim 20, wherein the composition comprises a cationic species that reduces nitride removal from the composite substrate.

38. The method of claim 20, wherein the fluoride ions comprise less than about 100% active fluoride ions.

10

39. The method of claim 20, wherein the slurry has a free alkalinity value of about 0.001-0.15 mol/l.

40. The method of claim 20, wherein the slurry has a total alkalinity
15 value of about 0.005-0.2 mol/l.

41. The method of claim 20, wherein the slurry is mixed prior to delivery to the surface of the substrate.

20 42. The method of claim 20, wherein the slurry is mixed on the surface of the polishing pad.